REMARKS

Applicants have carefully reviewed the Office Action mailed March 3, 2009, and thank Examiner Jennison for the detailed review of the pending claims. In response to the Office Action, Applicants have amended claim 1. Support for this amendment can be found at least on page 7, line 36. By way of this amendment, no new matter has been added. No new claims have been added and no claims have been cancelled. Accordingly, claims 2 and 13 – 30 remain pending in this application. At least for the reasons set forth below, Applicants respectfully traverse the foregoing rejections.

As Applicants' remarks with respect to the Examiner's rejections are sufficient to overcome these rejections, Applicants' silence as to assertions by the Examiner in the Office Action or certain requirements that may be applicable to such rejections (e.g., whether a reference constitutes prior art, motivation to combine references, assertions as to dependent claims, etc.) is not a concession by Applicants that such assertions are accurate or such requirements have been met, and Applicants reserve the right to analyze and dispute such assertions/requirements in the future. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicants expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03. Applicants respectfully request reconsideration of the present application in view of the above amendment and the following remarks.

Claim Rejections - 35 U.S.C. § 102

I. The Law

To anticipate a claim, the reference must teach every element of the claim. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention

must be shown in as complete detail as is contained in the... claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

A. *Clarke et al.* (U.S. Patent No. 5,211,327)

Claims 2, 13 – 21 and 24 were rejected under 35 U.S.C. § 102(b) as being anticipated by *Clarke et al.* (U.S. Patent No. 5,211,327) (hereinafter "*Clarke*"). Applicants would like to note that in the official office action the Examiner cited *Clarke et al.* as 5,221,327. Applicants believe this is a typographical error as U.S. Patent No. 5,221,327, *Rusin*, refers to Biological Processes for Recovering Heavy Metals and not a Method of Welding as in the case of 5,211,327 belonging to *Clarke et al.* Therefore, Applicants are assuming that the Examiner is referring to *Clarke et al.* 5,211,327. For at least the following reasons, Applicants respectfully traverse the rejection.

1. Independent Claim 2

Independent claim 2, as amended, recites: "A process for joining components for torque transmission in a vehicle, the components being made from hardenable steel and having a material thickness, by producing a weld seam without secondary heating, comprising:

positioning a welding electrode with respect to a weld line;

applying a voltage;

supplying a plasma gas;

forming an arc; and

melting the steel in the vicinity of the weld line over the entire material thickness, wherein the energy per unit length introduced by the welding process is in the range from 234 J/mm to 3360 J/mm."

i. *Clarke* cannot anticipate Applicants' independent claim 2

The *Clarke* reference discloses methods of using power beam welding of metal pieces while inhibiting cracking of a weld joint during a weld solidification process. *See* col. 3, lines 26 – 31. One method discussed by *Clarke* is preheating relatively heavy sections of high strength steels prior to power beam welding so as to prevent cracks. Col. 3, lines 4-6. Another method discussed in claim involves inhibiting cracking by "modifying at least one of the metal pieces in an area immediately adjacent and extending along the abutting surfaces whereby allowing weld

joint volume to transmute during weld solidification and thereby compensate for and inhibit formation of shrinkage related cracking of the weld joint." *See* col. 3, lines 40 – 45. *Clarke* also recites that in a "preferred form of the invention, a stress relief groove is spaced from the weld joint to define the width of the relatively narrow ligament. The relatively narrow ligament is configured to flex and reduce constraints on the weld joint during weld solidification thereby inhibiting formation of shrink related cracks." *See* col. 3, lines 49 – 55. Further, *Clarke* recites, "[W]elding conditions involved relative movement between the power beam and the abutting area at approximately 1.4 m/minute with the power beam approximating 4.5 kW." *See* col. 7 lines 26 – 29. Thus, the laser beam welding process having 1.4 m/minute weld speed and 4.5 kW laser intensity disclosed by *Clarke* is laser beam with a comparatively low energy per unit length of approximately 196 joules/mm.

In contrast to *Clarke*, independent claim 2 explicitly recites, "supplying a plasma gas… melting the steel in the vicinity of the weld line over the entire material thickness, wherein the energy per unit length introduced by the welding process is in the range from 234 J/mm to 3360 J/mm." This energy per unit length introduced by the claimed process defined by claim 2 of the present application (see para. [0025]) is considerably higher than in the case of beam welding in a CO_2 laser, which is explicitly disclosed in *Clarke* as being "the most effective." Col. 6, line 52 – 53; col. 7, lines 11-14.

Further, as described in the current application, "[i]n the case of plasma keyhole welding, the energy per unit length is preferably in a range which is at least a factor of four higher than in the case of a CO_2 laser a the same welding speeds." *See* para. [0025]. Applicants also disclose that during the plasma key-hole welding, energy is introduced into the hardenable steel to such an extent that self quenching or undesirable surface hardening of the material does not occur. *See* para. [0016].

Therefore, claim 2 recites a welding process that uses electrical gas discharge (plasma welding) to realize a concentrated high energy introduction of heat without secondary heating while avoiding major component distortion as a result of a large are introduction of heat. *See* para. [0016]. Further, despite the concentrated high energy introduction of heat, the heat distribution and heat management can be set in such a way that the cooling gradients do not enter

the critical range as occurs, for example, when using laser or electron beam welding, as disclosed by *Clarke*. For that reason only, there is no need for secondary heating before, during or after the welding operation and crack-free weld schemes can be obtained. *See* para. [0016].

Clarke discloses a relatively low energy per unit length of 1.4 m/minute at 4.5 KW laser intensity and therefore fails to teach, disclose or even suggest any type of welding process "wherein the energy per unit length introduced... is in the range from 234 J/mm to 3360 J/mm" as positively claimed by Applicants' independent claim 2. For at least this reason, Applicants' independent claim 2 is not anticipated by *Clarke*.

Further, only by very costly and complicated additional measures, such as the introduction of the stress relieving groove and slot below the weld joint that extends from one of the abutting surfaces to limit the depth of the weld joint, will cracks in the welded joints of hardenable steel be prevented according to *Clarke*. For at least this separate reason, Applicants' independent claim 2 is not anticipated by *Clarke*.

Dependent claims 13 – 21 and 24 depend upon claim 2 and are patentable over *Clarke* simply by virtue of their dependency upon claim 2. Withdrawal of the rejection with respect to claims 2, 13 – 21 and 24 is therefore respectfully requested.

Claim Rejections – 35 U.S.C. §103

I. <u>The Law:</u>

"To establish prima facie obviousness of a claimed invention, all the claim recitations must be taught or suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j).

"The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). "It can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way that the claimed invention does." *KSR Int'l v. Teleflex, Inc.*, 127 S.Ct. 1727, 1741 (2007).

A. *Clarke* in view of *Brenner et al.* (U.S. Patent No. 6,365,866)

Claims 22, 23, 25 and 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Clarke* in view of *Brenner et al.* (U.S. Patent No. 6,365,866) (hereinafter "*Brenner*"). For at least the following reasons, Applicants respectfully traverse the rejection.

Claims 22, 23, 25 and 26 are dependent on claim 2. The remarks presented above with respect to the § 102 rejection are equally applicable here. Specifically, the inadequacy of *Clarke* to teach every element of independent claim 2 by not teaching any type of welding process "wherein the energy per unit length introduced... is in the range from 234 J/mm to 3360 J/mm" as claimed by Applicants' independent claim 2, is also fatal to the Examiner's § 103 rejection.

Additionally, *Brenner* is directed to a method for welding hardenable steel, said method comprising pre-heating of said steel. *See* claim 1. Thus, *Brenner* actually teaches away from Applicants' disclosed invention, reciting there is no need for secondary heating before, during or after the welding operation and crack-free weld schemes can be obtained. *See* para. [0016]. Nor would one of ordinary skill in the art have had any reason to combine *Clarke* and *Brenner* in the manner required to obtain the claimed invention as *Clarke* specifically teaches away from "requiring expensive and time consuming preheat treatments." *See Clarke*, col. 4 lines 49 – 50. For at least this reason, claims 22, 23, 25 and 26 are allowable over the recited combination.

Furthermore, dependent claims 22, 23, 25 and 26, being dependent upon independent claim 2, are patentable by virtue of their dependency upon allowable independent claim 2. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

B. *Clarke* in view of *Kehrer* (WO 2002/070911)

Claims 27-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Clarke* in view of *Kehrer* (WO 2002/070911) (hereinafter "*Kehrer*"). For at least the following reasons, Applicants respectfully traverse the rejection.

Claims 27 – 30 are dependent on claim 2. The remarks presented above with respect to the § 102 rejection are equally applicable here. Specifically, the inadequacy of *Clarke* to teach every element of independent claim 2 by not teaching any type of welding process "wherein the

energy per unit length introduced... is in the range from 234 J/mm to 3360 J/mm" as claimed by Applicants' independent claim 2, is also fatal to the Examiner's § 103 rejection.

Nor does *Kehrer* make up for the deficiencies of *Clarke*. More specifically, while *Kehrer* is directed to the welding of vehicle parts such as transmissions wherein these parts are made form hardenable steel and are joined by plasma welding, *Kehrer* does not disclose any welding process "wherein the energy per unit length introduced... is in the range from 234 J/mm to 3360 J/mm" as claimed by Applicants' independent claim 2. Therefore, the combination of *Clarke* and *Kehrer* does not teach every recitation of independent claim 2. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the above amendment and remarks, the pending application is in condition for allowance. If, however, there are any outstanding issues that can be resolved by telephone conference, the Examiner is earnestly encouraged to telephone the undersigned representative.

It is believed no fees are due with this response. However, if any fees are required in connection with the filing of this paper that are not identified in any accompanying transmittal, permission is given to charge our Deposit Account No. 18-0013, under Order No. 66969-0003 from which the undersigned is authorized to draw. To the extent necessary, a petition for extension of time under 37 C.F.R. §1.136 is hereby made, the fee for which should also be charged to this Deposit Account.

Dated: June 3, 2009

Respectfully submitted,

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